

"...dedicated to the study, appreciation, and conservation of the native flora and natural communities of Illinois."



Merry Christmas, Illinois Native Plant Society Here is *Phoradendron leucarpum* (American Mistletoe), our North American substitute for the traditional European Mistletoe (*Viscum album*) used as an interactive Christmas decoration. Our American Mistletoe is native throughout the southern portion of North America extending south into Central America. In Illinois, look for it in the southern parts of the state. This photo was originally taken near Cairo, Illinois in Alexander County, an area with a high density of mistletoe. Photo by Paul Marcum.

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Message from the President

January 3, 2024

In November I had to step down as President of the Illinois Native Plant Society, effective immediately. I have had some health and family issues pop-up that I will be dealing with for more months to come. It was a heart wrenching decision, but one I had to make.

Unfortunately, the entire Executive Committee, except Susanne Masi, had tendered notices that they were also stepping away after giving much time and service to the Illinois Native Plant Society.

Please pay attention to the profiles of people running to serve on our board. Having practical managerial skills and/or previous experience with other 501(c)(3) boards is a major plus. In any civil society, service to an organization you are a member of demonstrates duty and support far better than dollars alone. Consider how you may serve.

Anyway, so long and thanks for all the fish.

Janine Catchpole



Message from the Editor



In this last issue of the year, we welcome two new writers to the newsletter: Jason Koontz and Todd Linscott. Jason Koontz teaches biology and environmental studies courses at Augustana College in Rock Island, IL and Todd Linscott teaches biology courses at Black Hawk College in Moline, IL. They will be co-authoring a Botany 101 feature. No matter what your skill level is with botany, I find that there is always something to learn from experts and I enjoy the different approaches to teaching about botany.

–Christopher David Benda, Editor

Left: Editor Chris Benda and the state endangered grass *Dichanthelium yadkinense* in Pope County, IL.

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INPS Seeking Governing Board Members

The Illinois Native Plant Society is seeking well-qualified individuals to serve on the State Governing Board who are committed to helping the organization grow to better serve our mission. We are currently looking to fill the following roles:

- President
- Treasurer
- Membership Chair
- Webmaster
- At-Large Members

Please refer to this page for descriptions of the roles: illinoisplants.org/inps-seeking-governing-board-members/

Application Process

If you wish to be considered for one of the advertised board positions, please reply to illinoisplants@gmail.com. In the subject line, please put the desired position you wish to be considered for. Please attach a photo, a brief biography and resume along with a statement addressing what you can offer the IL-NPS, and how your skills, knowledge and experience can help us fulfill our mission. Board members must be or become members in good standing prior to the election, which is slated to be held in January of 2024.

2024 INPS Research & Survey Grant Applications are now live!

Students, citizen scientists, and conservation groups are invited to apply for an INPS **Research Grant** for up to \$3,000 to fund one-year projects. This grant is for research studies on Illinois native plants such as life history, reproductive biology, demography, genetics, comparative site inventories, or habitat ecology; research on threats to native plants and communities, such as invasive species, are acceptable. Laboratory research on native plants, as well as projects focused on research relating to education about or restoration of native plants or communities are also eligible.

The **Survey Grant** is for up to \$5,000 will fund searches for Illinois Endangered, Threatened or several rare plant species of conservation concern for which current data is inadequate to assess their status and for which field surveys, and recovery recommendations, are needed. INPS worked with the Illinois Department of Natural Resources to develop a priority list of species for the Survey Grant. Experienced botanical field surveyors, either independent or associated with an institution, are invited to apply for this grant. Partnerships are encouraged.

Applications are due by January 31, 2024. Awards will be announced by March 31, 2024.

Chapter News

For information about each chapter, visit our website at illinoisplants.org/chapter-locations

Botany 101: Reviewing Basic Botanical Vocabulary

By Jason Koontz and Todd Linscott



As the weather starts to turn colder across the state and most of the vegetation starts to go to sleep, we thought it might be a nice time to start thinking ahead to next spring when we'll be surrounded by the diversity of flowering plants around us. With that in mind, we thought it might be helpful to review some of the botanical vocabulary used in identification guides and keys. If there are specific words or phenomena you'd want to learn more about please contact the *Harbinger* editor, Chris Benda (botanizer@gmail.com), and we'll use feedback to guide future articles in the Botany 101 column.

Flowering plants (Angiosperms) get the lion's share of the attention because they are the dominant and largest phylum of plants today. The evolution of the flower and fruit as well as other features of angiosperm anatomy have allowed this group to diversify and expand to all corners of the globe.

So what botanically is a flower? Simply put, it's the reproductive vehicle for facilitating the transfer of sex cells between plants. It's much like the cone seen in conifers (gymnosperms), where ultimately seeds are produced to continue the next generation.

Let's get into a little more detail. First, we should consider the way flowers transfer pollen (microspore/sex cell/sperm) from one to another. Many flowers simply use the wind so there is no evolutionary advantage to producing big showy flowers to attract a pollinator...all the flower does is have the pollen producing structures (stamens) produced in high numbers and the egg producing structure (carpel or pistil) have their stigmas (the tips where the pollen grain lands) visible, accessible, and often with a feathery appearance to help trap pollen from the wind. There's no sense in wasting energy to produce large showy structures...wind doesn't have eyes or a nose.



Wind pollinated flowers: here the stamens are fully out so the pollen can be carried away by the wind

On the other hand, flowers who co-opt an animal to help with the transfer need a means to get the animal to visit them. They often accomplish this through the use of showy sepals and petals (the two outermost layers of a flower or perianth) with attractive colors and/or they could be modified into spurs that often contain nectar as a reward to their visitors.

Second, we should consider what's called the breeding system of the flowering plant. Some plants require pollination from a different individual while others can produce viable seeds from their own flowers. The first breeding system is called outcrossing (or crossing) and the second is inbreeding (or selfing). From a genetic diversity perspective, mixing up genes would be best, hence crossing tends to be a lot more common. How do plants make sure they get pollen from another plant? One way is to structurally separate the stamen and carpels. This can be accomplished in monoecious (one house) plants because stamens are

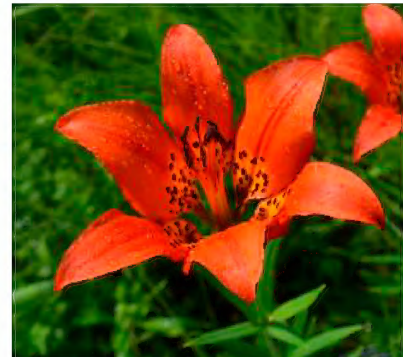
found in one flower and carpels are produced in a different flower on the same plant. But selfing could still occur if the flowers were open at the same time. In dioecious plants, an individual plant produces flowers that only have stamens and another plant produces flowers that only have carpels. So the flowers occur in separate “two houses” making crossing the default.

Yet, when most of us see flowers or picture them, we picture a synecious (same house) flower where the stamens and carpels are in the same flower. So in synecious and monoecious flowers, to ensure crossing, other mechanisms must occur (timing of pollen release and/or stigma receptivity or genetic compatibility/incompatibility/self-recognition are just two examples).

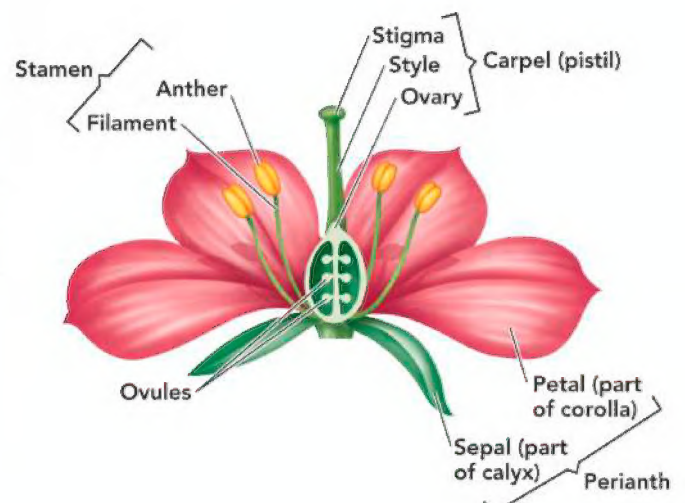
Another aspect of floral morphology deals with symmetry. When looking at a flower’s perianth how many different ways can you divide the flower into two and end up with mirror images? Symmetry is also important in animal body plans, and of course botanists have their own language to describe the symmetry of flowers. An actinomorphic (star shaped) flower has symmetry where it can be divided along many planes to get mirror images (animal folks might use radial to describe this condition). In contrast a zygomorphic flower can only be divided along one plane...any other and the two sides would not match. Bilateral is another way zygomorphy is often described. Think of the human body...a human’s right and left side are more or less equal. But our top half is very different from our bottom half.

Various keys will use a number of different terms to then describe the parts of the flowers. One way to think of a flower is to consider it a set of concentric rings, much like nesting dolls. Each ring is called a whorl and each whorl is made up of individual parts that can be free or fused together in various ways.

The outermost whorl is called the calyx and is composed of the sepals. One whorl in is the corolla (think Toyota) containing the petals. These two outermost whorls are often called the perianth because they are the sterile parts of the flower. The next innermost whorls are where the fertile parts are found: androecium with stamens producing the pollen with sperm and the gynoecium with pistil/carpels producing the ovary with eggs. We’ll leave discussion of fusion of the various parts for another time.

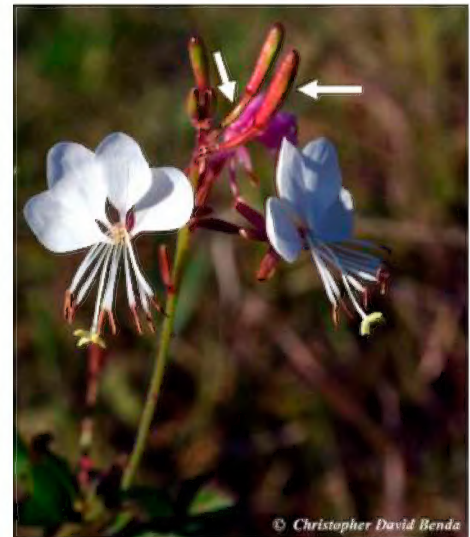


Top: Actinomorphic flowers of *Lilium philadelphicum*
Bottom: Zygomorphic flowers of *Baptisia alba*



Focusing in on the gynoecium for the moment, there are 3 basic parts of the carpel/pistil (the distinction of which we will also save for a different time...for now we'll stick with carpel). The apex or tip is called the stigma and this is where the pollen grains land or are placed by a pollinator. There can be a neck of various lengths called a style that connects the stigma to the base of the carpel called an ovary. In the ovary are the structures called ovules that have the eggs in them. The ovules ultimately become the seed.

There are two basic conditions in which we find the ovary: superior and inferior. This has to do with the orientation of the ovary in comparison to the rest of the flower. A superior ovary has its base 'above' (or sits upon) the other parts, while an inferior ovary is found below all of the other flower parts.



An example of an inferior ovary on *Guara biennis*. The left arrow points to an inferior ovary, while the right arrow points to the flower bud (the calyx covering the developing bud).

The last three terms we'll cover here takes a slightly different approach looking at ovary position and instead looks at how the floral whorls attach to or insert on the ovary. Hypogyny (hypogynous flowers) is the condition where the whorls attach below the ovary (hypo = low). A hypogynous flower then, by definition, has a superior ovary. The other end of this spectrum would then be epigyny (epigynous flower) where the whorls attach upon/above the ovary (epi = on/above). An epigynous flower has an inferior ovary. The last term to describe floral insertion is perigyny. It's an 'in between' condition where you may see various field guides and texts refer to the ovary as 'half inferior' or 'half superior' because it looks like the whorls are attaching to the middle of the ovary. In many cases the perigynous flower technically has a superior ovary, but the three outermost whorls are fused into a structure called a hypanthium ('cup') that can be fused to the ovary wall. One way to visualize this: breakfast cereal botany. Your cereal bowl is the hypanthium (base of the calyx, corolla, and androecium fused). Place the grapefruit you plan to eat the bowl to represent the ovary. Then place the edge of the handles of your knife and spoon (that you'd use to cut your grapefruit in half and eat it) on the edge of the bowl with them radiating outwards to represent the non-fused sepals, petals, and stamens.

This introduction to the flower, its various parts, and flower vocabulary commonly found in identification keys and field guides is meant to serve as a brief lesson for folks new to botany as well as a helpful refresher for those more knowledgeable on flowering plants.

Jason Koontz teaches biology and environmental studies courses at Augustana College in Rock Island, IL. Todd Linscott teaches biology courses at Black Hawk College in Moline, IL.

Bryophyte Survey at Route 66 Prairie in Litchfield, Illinois

By Chris Benda, Botanist

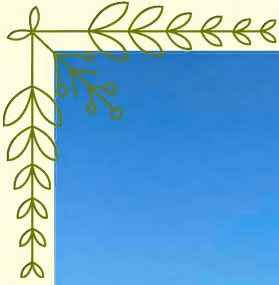
Bryophytes include mosses, liverworts, and hornworts and this group of plants is relatively overlooked by most plant enthusiasts. Even botanists struggle to become proficient with this relatively obscure group of plants. This is why bryophyte inventories are uncommon, especially inventories of bryophytes that occur in prairie habitat.



Yet, this past spring, Henry Eilers asked me and my botanical colleague Abel Kinser to conduct a basic inventory of bryophytes at Route 66 Prairie in Litchfield, Illinois. This site has been managed by Henry and other dedicated stewards and has been featured in other Harbinger issues. Henry had previously roamed the prairie and had a good idea of what species he wanted us to identify.

We conducted the inventory on April 2, 2023 and in total, we identified 12 species of mosses and 1 hornwort representing 10 families and 13 genera. The bryophytes encountered are *Hygroamblystegium varium* (tangled thread moss), *Ditrichum pallidum* (golden thread moss), *Fissidens taxifolius* (yew-leaved fork moss), *Pleuridium subulatum* (moss), *Weissia controversa* (green-cushioned weissia), *Ptychostomum pseudotriquetrum* (moss), *Thuidium delicatulum* (common fern moss), *Bryoandersonia illecebra* (spoon-leaved moss), *Plagiomnium cuspidatum* (baby tooth moss), *Brachythecium acutum* (steerecleus moss), *Atrichum angustatum* (slender starburst moss), *Rhynchostegium serrulatum* (moss), and an unidentifiable hornwort in the Anthocerotae.

It is important to document the flora of Illinois, especially understudied groups of plants like bryophytes. Not much is available to use to compare the bryophyte flora of Route 66 versus other prairies, which is why an inventory like this is so important. Thanks to the Central Chapter of the Illinois Native Plant Society for providing funding for this study.

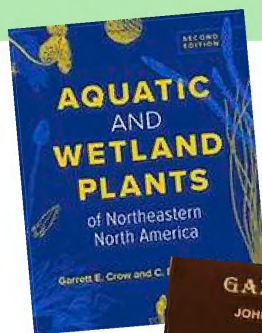


From left: Abel Kinser, Henry Eilers, and Chris Benda

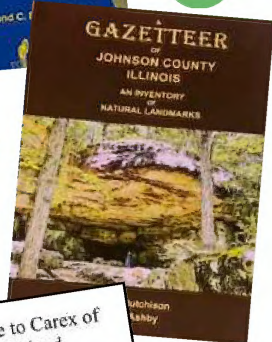


Brachythecium acutum

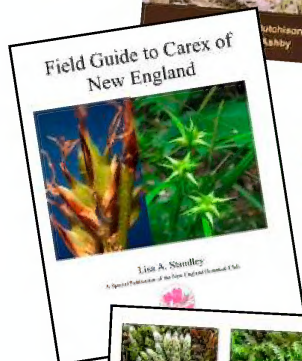
Other News, Articles, Web Links, & Videos



Check out a new book from the University of Wisconsin Press, **Aquatic and Wetland Plants of Northeastern North America** (Second Edition) by Garrett E. Crow and C. Barre Hellquist. Learn more: uwpress.wisc.edu/books/5921.htm



Published this year by Max Hutchison and Joe Ashby, **A Gazetteer of Johnson County, Illinois**, is “filled with over 550 photographs and maps, both old and new, of over 500 natural and historic landmarks, from hills and bluffs to caves and waterways, as well as quips and quotes from early settlers to residents of today.” Learn more and order here: hutchisonashbypublishing.com



Available as a PDF from the New England Botanical Society, the **Field Guide to Carex of New England** by Lisa A. Standley first published in 2011 is a “user-friendly guide to *Carex*” containing descriptions and treatments for the *Carex* groups, plus a glossary and description of taxonomic relationships. View the field guide here: tinyurl.com/StandleyCarexNewEngland



Are you planning on botanizing mosses this winter? Then this field guide is for you. Available as a PDF from the Morton Arboretum, **A Photo Guide to Some Outstanding Mosses of the Morton Arboretum** published by Wayne Lampa, Patricia Armstrong, Scott Kopal, Carol Kopal, and Andrew Hipp has hundreds of helpful photos and habitat descriptions. Get out your 10x hand lens and start looking! View the field guide here: tinyurl.com/OutstandingMossesMorton



“Forget the lantern fly. A mysterious new pest has scientists sounding the alarm. A **parasitic worm that attacks beech trees** is wreaking havoc on forests from Maine to Virginia.” Read more from NBC News: <https://tinyurl.com/BeechNematode>



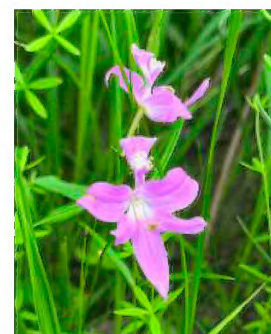
“Bourbon Industry Has a Tree Problem: The spirit must age in oak barrels, and the industry is set on saving the crucial tree”

Read more from Newser:

newser.com/story/341743/bourbon-industry-has-a-tree-problem.html



“Nature detectives at work: Tracking rare and unusual species in Will County preserve” is an article featuring the important work the Forest Preserve District of Will County performs to monitor and protect rare species. Read the article here: tinyurl.com/NatureDetectivesWillCo





“A vision for Illinois nature: Vanishing biodiversity and human loneliness are intertwined. They can help each other” written by Friends of Illinois Nature Preserves Director Amy Doll and published in the Illinois Times outlines a vision for mending human relationships and nature simultaneously.

Read the article here:

www.illinoistimes.com/news-opinion/a-vision-for-illinois-nature-17681824

On the blog Strategies for Stewards: From Woods to Prairie, read a recent post titled “What is Grade A prairie?”
tinyurl.com/WhatIsGradeAPrairie



From Smithsonian Magazine, read the article “Pollination From Honeybees Could Make Plants Less Fit to Survive and Reproduce”
tinyurl.com/HoneybeesInbreedPlants

From ScienceAlert, read the article “Flowers Are Evolving to Self-Pollinate, And It Could Be a Big Problem”
tinyurl.com/SelfPollinatingProblem

Check out Illinois Botanizer's Best of Nature Photos 2023 on Facebook
tinyurl.com/IllinoisBotanizerBestof2023

Botany Humor

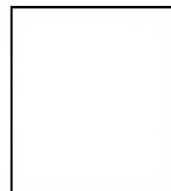




ILLINOIS NATIVE PLANT SOCIETY

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illinoisplants@gmail.com
www.illinoisplants.org



The Harbinger Winter 2023

You can renew/join by filling out the form below or online at illinoisplants.org/online-membership-form/.

Please become a member and support this local non-profit organization dedicated to the preservation, conservation, and study of the native plants and vegetation of Illinois!

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INPS, Membership, P.O. Box 60694, Chicago, IL 60660

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☐ Check here to receive the newsletter BY MAIL.

Erigenia, our scientific journal, is now available digitally as well as in print. Please indicate your preference for receiving the journal.

☐ Email Only ☐ Postal Mail Only ☐ Both

Chapter Affiliation

- | | |
|------------------------------------------------------|----------------------------------------------------|
| <input type="checkbox"/> Central (Springfield) | <input type="checkbox"/> Northeast (Chicago) |
| <input type="checkbox"/> Forest Glen (Westville) | <input type="checkbox"/> Quad Cities (Rock Island) |
| <input type="checkbox"/> Grand Prairie (Bloomington) | <input type="checkbox"/> Southern (Carbondale) |
| <input type="checkbox"/> Kankakee Torrent | <input type="checkbox"/> Other/Uncertain |

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- ☐ Student.....\$15⁰⁰
☐ Individual.....\$25⁰⁰
☐ Family.....\$35⁰⁰
☐ Institutional (nonvoting)....\$20⁰⁰
☐ Supporting.....\$50⁰⁰
☐ Patron.....\$100⁰⁰
☐ Business.....\$125⁰⁰
☐ Life.....\$500⁰⁰
☐ *Iliamna* (Life).....\$1,000⁰⁰
☐ *Dodecatheon* (Life).....\$2,000⁰⁰
☐ *Erigenia* (Life).....\$5,000⁰⁰

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- ☐ Leadership & Organization
Serving on Board at State or Chapter Level
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- ☐ Organizing Workshops &/or Seminars
- ☐ Giving Workshops &/or Seminars
- ☐ Public Speaking
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- ☐ Website Assistance/Management
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